Marcus Hook Refinery
HON

Sun Refining and Marketing Company
P O Box 426
Marcus Hook PA 19061-0426

March 25, 1993

PAD 980550594

Mr. Paul Gotthold
RCRA Programs Branch
U.S. Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, PA 19107

Dear Mr. Gotthold:

Enclosed, in five volumes, is a revised Phase I Stabilization Measures Work Plan for Sun Company's Marcus Hook Refinery (Permit No. PAD 980550594). As in the original Work Plan submitted on November 2, 1992, Volume 1 contains the Work Plan text, Volume 2 contains the drawings, and Volumes 3a - 3c contain the appendices. The Work Plan was developed to meet the Phase I Stabilization Measures requirements of the draft Corrective Action Permit issued on July 23, 1992; the revisions to the work plan were made in response to comments received at the meeting at EPA's offices on February 19, 1993. The Phase I Stabilization activities are consistent with the closure of Solid Waste Management Unit No. 96, the Middle Creek Surface Drainage System, a surface impoundment, as a landfill.

Sun appreciates your efforts in reviewing this Work Plan. Sun is prepared to meet with you further to review any details of the work plan. Please contact me at (215) 339-2215 if you have any questions.

Very truly yours,

Charles D. Barksdale Jr., P.E.
Senior Environmental Consultant

Enclosures

cc: Pa. Department of Environmental Resources
Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428
Attn: Mr. Lawrence Lunsk

Sun Refining and Marketing Company
P O Box 426
Marcus Hook PA 19061-0426

January 20, 1993

Mr. Stephen Hon Lee (3HW51)
U.S. Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, PA 19107

Dear Mr. Lee:

Enclosed, as you requested, are drawings which were missing from Volume 2 of the Phase I Stabilization Measures Work Plan for the Sun Company Inc. (R&M) Marcus Hook Refinery (Permit No. PAD980550594). This work plan was submitted to the USEPA in early November, 1992.

The drawings included with this letter include:

Drawing 2-1	Test Boring Location Plan
Drawing 2-2	Soft Sediment Sample Locations
Drawing 2-3	Stratigraphic Cross-Sections
Drawing 2-4	Water Table Contour Map
Drawing 3-1	IFR Sample Locations
Drawing 4-9	Layout - Zone C

We appreciate your efforts in reviewing this Work Plan and are prepared to meet with you to review any the details of this work plan. Please contact me at (215) 339-2215 if you have any questions or to set up a meeting.

Very truly yours,

Charles D. Barksdale Jr., P.E.
Senior Environmental Consultant

Enclosures

John A. Rossi
Manager
Delaware Valley Refining Complex

Sun Company, Inc.
Refining & Marketing Division

Marcus Hook Refinery
PO Box 426
Marcus Hook PA 19061-0426
215 447 1001

Philadelphia Refinery
3144 Passyunk Avenue
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November 2, 1992

Mr. Paul Gotthold
RCRA Programs Branch (3HW51)
U.S. Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, PA 19107

Dear Mr. Gotthold:

Enclosed, in three volumes, is a Phase I Stabilization Measures Work Plan for Sun Company's Marcus Hook Refinery (Permit No. PAD 980550594). Volume I contains the Work Plan text, Volume II contains the drawings, and Volume III contains the appendices. The Work Plan has been developed to meet the Phase I Stabilization Measures requirements of the draft Corrective Action Permit issued on July 23, 1992. The Phase I Stabilization activities are consistent with the closure of Solid Waste Management Unit No. 96, the Middle Creek Surface Drainage System.

Sun is submitting the Work Plan now, prior to the final corrective action permit being issued, in an effort to speed up the approval process. Hopefully the USEPA can review this document concurrent to working on the revision and issuance of the final Corrective Action Permit (in total or specifically for the Middle Creek Surface Drainage System). USEPA approval of this Work Plan within 4 to 6 weeks is needed to allow for adequate timing to complete the work within the regulatory deadlines for closure of the Middle Creek Conveyance.

We appreciate your efforts in reviewing this Work Plan. We are prepared to meet with you to review any the details of this work plan. Please contact Mr. Charles D. Barksdale Jr. at (215) 339-2215 if you have any questions or to set up a meeting.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assured that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the informatin is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Very truly yours,

John A. Rossi
Manager, Delaware Valley Refining Complex

Enclosures

cc: Pa. Department of Environmental Resources
Lee Park Suite 6010
555 North Lane
Conshohocken, PA 19428
Attention: Mr. Lawrence Lunsk

SUN

PAD 980550594

Sun Refining and Marketing Company
P O Box 426
Marcus Hook PA 19061-0426

February 7, 1992

Mr. Hon Lee
U. S. Environmental Protection Agency
841 Chestnut Building
Philadelphia, PA 19107

Dear Mr. Lee:

Per our discussions, attached is the Class I Permit Modification for the existing Hazardous Waste Management Permit for the Sun Refining and Marketing Company, Marcus Hook facility. This modification is pursuant to changes in the Closure Plan for the Middle Creek Conveyance System.

We appreciate your continued guidance and look forward to meeting with you to discuss this submittal and how it relates to the overall Middle Creek Project.

Sincerely,
SUN REFINING AND MARKETING COMPANY

Gary P. Rabik
Manager, Environmental Engineering

GPR:erg
Attachment
GPR:HL07

February 7, 1992

RCRA CLASS I PERMIT MODIFICATION

SUN REFINING AND MARKETING COMPANY

MARCUS HOOK REFINERY

Prepared by:

ENSR Consulting and Engineering

1.0 INTRODUCTION

This document represents a request for a Class I modification to the existing Hazardous Waste Management Permit for the SUN Refining and Marketing Company, Marcus Hook facility. A modification is necessary to account for changes in the closure of the Middle Creek conveyance.

The Middle Creek conveyance is considered a RCRA-regulated unit as a result of both the Toxicity Characteristic (TC) and the Primary Sludge Rules. The extent of this unit is shown in Figure 1. The Middle Creek conveyance also comprises a portion of a solid waste management unit (SWMU) identified in EPA's RCRA Facility Assessment (RFA) Report as the Middle Creek Surface Drainage System (SWMU 96). The Conveyance is subject to RCRA closure. The overall SWMU is subject to corrective action. While this permit modification addresses the closure, SUN recognizes that substantial portions of work associated with phase-out of the unit may be accomplished under corrective action as a Stabilization project pursuant to the initiative announced jointly by EPA Headquarters Office of Solid Waste and Office of Waste Programs Enforcement in an October 25, 1991 memorandum to EPA Regional Offices.

The Middle Creek conveyance is being replaced by a completely new storm/process water system that will include construction of an enclosed pipe process collection sewer and an impervious storm water conveyance built within portions of the Middle Creek conveyance bed. Based on preliminary design and engineering assessments, SUN anticipates that construction of this new system will require some movement and/or physical stabilization of Middle Creek bed materials within the confines of the existing Middle Creek Surface Drainage System. This construction and remediation program (known as the "Middle Creek Abatement Project") will be designed to be consistent with the overall closure and corrective action objectives for the Marcus Hook facility.

To fully account for potentially contaminated materials within the Middle Creek Surface Drainage System and to facilitate the comprehensive closure and new construction program, the Middle Creek Surface Drainage System SWMU (Middle Creek SWMU) will be further defined, for corrective action purposes, to extend laterally approximately 100 feet on either side of the Middle Creek conveyance. Depending on the characteristics of contaminated media found within the Middle Creek conveyance during construction as determined by a sampling plan developed and implemented pursuant to EPA approval, SUN will assess the use of and employ one or more <u>in situ</u> remediation techniques including, but not limited to, bioremediation, soil venting, thermal treatment or physical stabilization, if necessary. These <u>in situ</u> techniques will be performed within the confines of the Middle Creek SWMU and will

also enable waste material to be left in place to structurally support the impervious stormwater conveyance to be constructed within portions of the closed Middle Creek conveyance.

Treatment steps will involve movement of material within the Middle Creek SWMU to facilitate the comprehensive closure and new construction program. This approach will ensure that contaminated media has been stabilized and that the new enclosed process sewer and impervious stormwater conveyance can be completed by the March 1994 date by which the old Middle Creek conveyance can no longer handle TC wastes. The in situ treatment of contaminated media by bioremediation or other technologies would not only serve to stabilize this material, but could also be used as a pilot or treatability study to determine the success of various remediation techniques.

The remediation and construction work within the Middle Creek conveyance itself will be consistent with the regulatory requirements for closure and the corrective action objectives for the Marcus Hook facility. Since the new impervious conveyance will be constructed over parts of the Middle Creek conveyance, it will serve as the closure cap minimizing and/or preventing surface infiltration for those areas so covered.

Finally, concurrent with the Middle Creek Abatement Project, SUN proposes to initiate a comprehensive perimeter investigation of groundwater to determine the extent and nature of potential groundwater contamination and whether a groundwater recovery and treatment system is necessary. Thus, closure of the Middle Creek conveyance, combined with groundwater assessment and remediation efforts will ensure that there is no unacceptable off-site impact to human health or the environment from the Middle Creek conveyance and/or the Middle Creek SWMU.

2.0 CLOSURE PLAN MODIFICATIONS

2.1 Background and Permit History

The Middle Creek conveyance is an unlined channel within the refinery which receives primary treated process wastewaters, draw-off water from product storage tanks, cooling wastewaters generated by various facility operations, and stormwater runoff. The Middle Creek conveyance transports these storm/process waste waters to on-site pretreatment facilities. Treated wastewaters are then discharged to the Delaware County Regional Authority (DELCORA) system, a regional publicly owned treatment works.

On September 25, 1990, the Toxicity Characteristic (TC) Rule became effective. This rule expanded the regulatory definition of hazardous waste. As a result of the TC Rule, the Middle Creek conveyance became a regulated hazardous waste surface impoundment. SUN submitted a Class I permit modification to EPA on September 24, 1990 to include this new hazardous waste unit in its existing hazardous waste operating permit. This existing permit had been issued on July 6, 1990 for other hazardous waste management units at the facility. By submitting the permit modification, and amending the RCRA Part A permit application and Notification of Hazardous Waste Activity, the Middle Creek conveyance attained for RCRA interim status.

On May 2, 1991, EPA promulgated the Primary Sludge Rule. This rule expanded the definition of hazardous waste by creating two new hazardous waste listings (F037 and F038) for primary sludge generated at refineries. As a result of this rule, SUN submitted a second
Class I permit modification to EPA on March 22, 1991 for the Middle Creek conveyance. A combined Class III permit modification addressing both the TC and Primary Sludge Rules was submitted to EPA on March 26, 1991.

2.2 Existing Closure Plan

The permit modifications submitted to EPA included a closure plan describing the steps to be taken to close the Middle Creek conveyance once the unit was taken out of service. This closure plan recognized that "clean closure" (i.e., excavation of all contaminated sludges and soils) would not be a viable option. Therefore, the closure plan described a general approach to closure which combined limited removal of wastes and waste residues and in place stabilization of remaining waste residues. Once waste residues were stabilized, the closure plan specified that the unit be capped, monitored and maintained in accordance with the hazardous waste landfill requirements.

2.3 Reason for Closure Plan/Permit Modification

Surface impoundments which were newly regulated as a result of the TC Rule must be retrofitted to meet the double liner and leachate collection system requirements of 40 CFR Sections 264.221 and/or 265.221 by March 1994 if such units are to continue to manage hazardous wastes after that date. Rather than retrofit this unit, SUN has decided to close it and construct a new system to convey storm/process waters. SUN must no longer use the Middle Creek conveyance and have the new system in operation by the March 1994 deadline.

Due to the size of the Middle Creek conveyance and the magnitude of this closure and construction project, SUN will begin preparation for closure within the next few months in order to be able to meet the March 1994 statutory deadline for terminating use of the surface impoundment. However, prior to beginning closure activities, SUN's closure plan must be modified to accurately reflect the steps which will be undertaken during closure. Therefore, the Class I RCRA permit modification set forth in this document is necessary to modify the closure approach for the Middle Creek conveyance.

2.4 Description of Closure Plan Modifications

SUN has evaluated a number of options for closure of the Middle Creek conveyance and construction of the new impervious system. Based on this evaluation, SUN has developed preliminary design specifications for closure which combine movement and consolidation of materials within the confines of the Middle Creek SWMU (as defined on page 1.0-1), <u>in situ</u> treatment/stabilization and reuse, followed by construction of an enclosed pipe process collection sewer and an impervious stormwater conveyance built within portions of the Middle Creek conveyance bed. The impervious stormwater conveyance will serve as a final RCRA cover for portions of the Middle Creek conveyance.

The closure and impervious conveyance system designs have been developed to meet the closure performance standards of 40 CFR Section 265.111, satisfy the closure performance standards for landfills and be consistent with the approach outlined in SUN's original closure plan. The major elements of the preliminary design for the project are summarized below:

- Staged construction of the new system with pumping of storm/process waste waters around this construction
- Movement of sludges and residual materials from some areas of the Middle Creek conveyance to other locations within the Middle Creek SWMU

- In place stabilization of sludges and residuals materials in certain areas of the Middle Creek conveyance

- Staging of materials within the Middle Creek SWMU

  Using staged materials as fill or stabilization materials within the Middle Creek conveyance

  In situ treatment of staged materials within the Middle Creek SWMU

- Construction of the new impervious conveyance system within the Middle Creek conveyance bed

- Installation of a process water piping system within the Middle Creek conveyance bed within the impervious conveyance system

- In situ management of remaining materials and closure of areas of the Middle Creek conveyance that are not capped by the new impervious conveyance system

2.4.1 Use of the Middle Creek Bed

SUN will construct an impervious conveyance within the existing Middle Creek conveyance bed. This approach will allow SUN to provide a final, impervious cover to portions of the closed Middle Creek conveyance while utilizing the natural stormwater drainage patterns at the Marcus Hook Refinery.

SUN anticipates that movement of primary sludges and residuals within the existing Middle Creek conveyance to other locations within the Middle Creek SWMU will be necessary for construction and installation of the new impervious conveyance system unit. Based on very preliminary design specifications, excavation of up to 13 feet deep (below the ground surface) and 30 feet wide may be necessary in some areas of the Middle Creek conveyance. Excavated material will be staged within the boundaries of the Middle Creek SWMU. As previously mentioned, the Middle Creek SWMU will be approximately defined as extending laterally 100 feet on either side of the Middle Creek conveyance. Defining the SWMU in this manner will facilitate completion of the closure/stabilization/construction project.

2.4.2 Management of Staged Materials

SUN will employ several different alternatives for handling staged material. SUN's preferred alternative will be to use the staged material as fill within the Middle Creek SWMU wherever possible. Since the material will not be moved outside the confines of the Middle Creek SWMU, using the material in this manner will not subject it to the RCRA land disposal restrictions. The staged material will also be mixed with sludges and/or residual materials remaining within the Middle Creek conveyance to physically stabilize these materials and result in an engineered fill material suitable for use as foundation support for the conveyance. This physical stabilization may be necessary to provide adequate load bearing capacity for the unit's final cover as required by 40 CFR Section 265.228(a)(ii).

Any primary sludge and residual material which may remain after construction of the new impervious conveyance system will be managed within the boundaries of the Middle Creek SWMU. Sampling and analysis will be performed on these materials to determine the most effective treatment technology. Such treatment technologies could include bioremediation, soil venting or thermal treatment. If excess staged material cannot be treated within the confines of the Middle Creek SWMU, such material will be managed outside the SWMU. SUN will make every effort to minimize the amount of material requiring management outside the SWMU.

2.4.3 Stabilization

Depending on the sludge column thickness, not all primary sludge or residual materials may be removed in some portions of the Middle Creek conveyance. Within these portions, SUN will perform <u>in situ</u> stabilization of remaining primary sludge and residual material. Such stabilization will serve two (2) purposes: it will fix or bind chemical constituents to the material thereby preventing or minimizing the leaching of constituents and it will allow the remaining materials to attain a bearing capacity sufficient to support a final cover as required by 40 CFR Section 265.228(a)(2)(ii).

2.4.4 Installation of Final Cover

Once sludge and residual materials have been removed or physically stabilized within a given area of the Middle Creek conveyance, sections of final cover will be constructed and installed. The impervious conveyance system to be installed within the Middle Creek conveyance bed will serve as the unit's final cover designed and constructed to:

- Provide long-term minimization of the migration of liquids through the closed surface impoundment as required by 40 CFR Section 265.228(a)(iii)(A);

- Function with minimum maintenance as required by 40 CFR Section 265.228(a)(iii)(B);

- Promote drainage and minimize erosion or abrasion of the final cover as required by 40 CFR Section 265.228(a)(iii)(C);

- Accommodate settling and subsidence so that the cover's integrity is maintained; and

- Have a permeability less than or equal to the permeability of the natural soils present.

The impervious conveyance will also serve as a stormwater conveyance for the Marcus Hook Refinery and provide secondary containment for an enclosed process collection sewer that will be constructed within the former Middle Creek conveyance. This sewer will carry process wastewaters to the on-site wastewater pretreatment plant.